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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte HANS-DETLEF LUGINSLAND,
ANDRE WEHMEIER, OLEG STENZEL, and
STEFAN UHRLANDT

Appeal 2010-001210
Application 10/542,850
Technology Center 1700

Before TERRY J. OWENS, TONI R. SCHEINER, and MARK NAGUMO,
Administrative Patent Judges.

Opinion for the Board filed by *Administrative Patent Judge Nagumo.*

Opinion dissenting filed by *Administrative Patent Judge Owens.*

NAGUMO, *Administrative Patent Judge.*

DECISION ON APPEAL¹

¹ The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, or for filing a request for rehearing, as recited in 37 C.F.R. § 41.52, begins to run from the “MAIL DATE”

A. Introduction^{2, 3}

Hans-Detlef Luginsland, Andre Wehmeier, Oleg Stenzel, and Stefan Uhrlandt (“Luginsland”) timely appeal under 35 U.S.C. § 134(a) from the rejection⁴ of claims 1-8, 18, 19, and 23-31.⁵ We have jurisdiction under 35 U.S.C. § 6. We REVERSE.

The subject matter on appeal relates to precipitated silicas that are said to be especially useful as fillers for rubber mixtures. The silicas are said to provide improved rubber processing (e.g., lower viscosity and faster rates of vulcanization) as well as improved finished rubber properties (e.g., lower rolling resistance for tires and improved road abrasion properties compared to prior art silicas. (Spec. 39-40.) The improvements are attributed to a purportedly previously unrecognized parameter, the relative silanol group density, measured by the ratio of the Sears value V_2 to the total (BET) surface area. The Sears value, reported in units of ml/(5 g) is said to be a

(paper delivery mode) or the “NOTIFICATION DATE” (electronic delivery mode) shown on the PTOL-90A cover letter attached to this decision.

² Application 10/542,850, *Specially Precipitated Silicic Acids for Rubber Applications*, filed 13 June 2006, as the National Stage of an International Application filed 8 January 2004, claiming the benefit of German applications filed 13 December 2003 and 22 January 2003 . The specification is referred to as the “850 Specification,” and is cited as “Spec.” The real party in interest is listed as Evonik Degussa GmbH. (Appeal Brief, filed 15 April 2009 (“Br.”), 1.)

³ Heard 15 July 2010. The Official Transcript has been made of record.

⁴ Office action mailed 16 July 2008 (“Final Rejection”; cited as “FR”).

⁵ Claims 9-17 and 20 have been withdrawn from consideration. (FR 1.)

measure of the absolute number of silanol groups.⁶ (Spec. 5, ll. 27-29.) The BET surface area is determined by adsorption of nitrogen gas and is reported in units of m^2/g . (Spec. 1, l. 36 to 2, l. 4.) The more silanol groups that are available for interaction with the rubber matrix, the more effective the silica filler.

Representative Claim 1 reads:

1. A precipitated silica which has the following physical and chemical properties:

CTAB surface area	100-200 m^2/g ,
BET/CTAB ratio	0.8-1.05,
DBP value	210-280 $\text{g}/(100 \text{ g})$,
Sears value V_2 [sic: V_2]	10-30 $\text{ml}/(5 \text{ g})$,
Moisture level	4-8%, and
<i>Ratio of Sears value V_2 to BET surface area</i>	0.150 to 0.370 $\text{ml}/(5 \text{ m}^2)$.

(Br., Claims App. 1 [pages unnumbered]; emphasis added.)

(The other parameters recited in claim 1 are disclosed to be relevant to the interaction of the precipitated silica with rubber. The surface area accessible to rubber is parameterized by adsorption of a large molecule and called the “CTAB” surface area. (Spec. 2, ll. 4–9.) The BET/CTAB ratio is said to be a measure of microporosity, lower values indicating that a lower

⁶ The method of determining the “modified” Sears value is described in the 850 Specification at 22, l. 33, through 24, l. 10. The volume is the volume in milliliters of a 0.1 M KOH solution needed to titrate a prepared aqueous sample of silica from its initial pH to a pH of 6, normalized for a theoretical specimen weight of 1 g and multiplied by 5 to yield the value in the reported units.

amount of the total surface area is blocked from interaction with rubber molecules. Commercially available active silicas are said to have BET/CTAB ratios greater than 1.05. (*Id.*, ll. 12-18.) According to the 850 Specification, the DPB value is a measure of interaggregate structure in silicas, a high value being needed to ensure ideal dispersion of the silica in the rubber. (*Id.* at 3, ll. 12–20.) Moisture levels greater than 4% are needed to ensure rapid silanization of the silica with organosilicon compounds. (*Id.*, ll. 20–25.))

The Examiner has maintained the following grounds of rejection:⁷

A. Claims 1-17, 18, 19, and 23-31 stand rejected under 35 U.S.C. § 103(a) in view of the combined teachings of Esch⁸ and Boyer.⁹

B. Claim 8 stands rejected under 35 U.S.C. § 103(a) in view of the combined teachings of Esch and Boyer, and Uhrlandt.¹⁰

C. Claims 1-7, 18, 19, and 23-29 stand rejected under 35 U.S.C. § 103(a) in view of the combined teachings of Esch and Luginsland 693.¹¹

⁷ Examiner's Answer mailed 4 August 2009. ("Ans.").

⁸ Heinz Esch et al., *Precipitated Silicas*, U.S. Patent 5,846,506 (1998).

⁹ James L. Boyer et al., *Amorphous Precipitated Silica*, U.S. Patent 5,935,543 (1999).

¹⁰ Stefan Uhrlandt et al., *Readily Dispersible Precipitated Silica*, U.S. Patent 6,180,076 B1 (2001).

¹¹ Hans-Detlef Luginsland, *Mixtures Comprising a Filler and Organosilicon Compound*, U.S. Patent Application Publication US 2001/0022693 A1 (2002).

D. Claims 1-5, 7, 8, 18, 19, and 23-31 stand rejected under 35 U.S.C. § 103(a) in view of the combined teachings of Uhrlandt and Boyer.

E. Claims 1-8, 18, 19, and 21-23 stand rejected under provisional obviousness type double patenting in view of claims 1-9, 16, 17, and 19-21 of Stenzel.¹²

Luginsland argues that the Examiner failed to establish a prima facie case of obviousness over the prior art because none of the references, alone or in combination, teach or suggest that the ratio of Sears value V_2 to BET surface area recited in the claims results in the “excellent suitability as reinforcing fillers for elastomers.” (Br. 4.) In the alternative, Luginsland urges that the improved properties rebut any prima facie case of obviousness. (*Id.* at 6–10.) The improved properties are said to include improved processing properties of shorter vulcanization times and lower Mooney viscosities and superior vulcanized rubber properties, including superior tensile and wear properties correlated with improved (i.e., lowered) rolling resistance in tires. (*Id.* at 7–8, citing the comparisons in the 850 Specification and quoting the Declaration of co-inventor Mr. André Wehmeier (Exhibit A; “Wehmeier”).)¹³

¹² Oleg Stenzel et al., *Highly Dispersible Silica for Using in Rubber*, Application 10/542,763, filed 17 January 2006, as the National Stage of an International Application PCT/EP04/50005, filed 8 January 2004. This application has been assigned appeal number 2010-005553, but has not yet been assigned to a panel.

¹³ Luginsland also contests the Examiner’s objection to claim 24 as being dependent on claim 9, which has been withdrawn from consideration. (Br. 16.) According to Luginsland, claim 9 was restricted improperly. (*Id.*) These matters are beyond our jurisdiction, which is limited to appeals from rejected claims. Relief should have been sought via a timely filed petition to

The Examiner maintains that the disclosure of overlapping ranges of V_2 and BET surface areas, individually, suffices to establish prima facie obviousness. (Ans. 5.) The Examiner notes that both the Sears V_2 and the BET characteristics are disclosed in Esch. (*Id.*) “Once a ratio is obtained,” the Examiner continues, “it is noted that an overlapping range of ratio with the instant application is obtained, and it is well established that overlapping ranges have been held to establish prima facie obviousness.” (*Id.* at 19, *citing* MPEP § 2144.05.) The Examiner declines to accord significant weight to the showing of unexpected results, arguing that a single comparison is inadequate to establish criticality over the range of what is claimed. (*Id.* at 20.)

B. Discussion

Findings of fact throughout this Opinion are supported by a preponderance of the evidence of record.

As our reviewing court has stated many times, there are no *per se* rules in patent law. *E.g., In re Ochiai*, 71 F.3d 1565, 1572 (Fed. Cir. 1995) (“reliance on *per se* rules of obviousness is legally incorrect and must cease. . . . We once again hold today that our precedents do not establish any *per se* rules of obviousness, just as those precedents themselves expressly declined to create such rules.”).

the Director. (37 C.F.R. § 181; see also Manual of Patent Examining Procedure (“MPEP”), § 1002.02(c) Petitions and Requests Decided by the Technology Center Directors.)

The court's observation that "[a] *prima facie* case of obviousness typically exists when the ranges of a claimed composition overlap the ranges disclosed in the prior art," *In re Peterson*, 315 F.3d 1325, 1329 (Fed. Cir. 2003) (citations omitted; emphasis added) did not establish a *per se* rule of prima facie obviousness. Rather, the court stressed, obviousness must be assessed on the facts of each case. In *Peterson*, for example, the court found that the record demonstrated that the ranges recited in the claims were somewhat narrower than the ranges of those parameters taught by the prior art of record. On those facts, the court held, the evidence was sufficient to support the legal conclusion of obviousness. It is notable that all of the parameters at issue in *Peterson* were completely described: none had to be derived, as in the present case.

In the present case, as Luginsland stresses (Br. 5), and the Examiner does not deny, Esch does not teach that the ratio $V_2/(\text{BET})$ is a parameter that can be varied to optimize some property of the precipitated silica. Moreover, as Luginsland points out, "[t]he highest relative silanol group density disclosed in Esch is 0.1125, which is about 25% lower than the lowest limit in the present claims." (*Id.*, emphasis omitted.)¹⁴ Luginsland

¹⁴ The dissent believes Luginsland and the Examiner "apparently" erred in comparing Sears values, and therefore the V_2/BET ratios, by failing to correct the Sears values reported by Esch by a factor of 5. (Dissent 1.) Neither the Examiner nor Luginsland raised this issue. (Luginsland is ideally situated to speak with authority, as there are common inventors on the Esch patent and the Luginsland application.) The Dissent calculates "endpoint" ratios, but neglects to observe that the V_2/BET ratio of Esch Example III would change from 0.1125 to $5 \times 0.1125 = 0.5625$, which is well beyond the highest ratio (0.370) recited in claim 1. In other words, if the Dissent's objection were true, Esch provided a sample far superior in

makes similar arguments regarding the rejection based on Uhrland, which, according to Luginsland, uses silicas according to Example 3 of Esch. (Br. 12-13.) As Uhrland is essentially cumulative with Esch, we need refer only to Esch in the following discussion.

The difficulty with the Examiner's position is that the Examiner has not directed our attention to any credible evidence that a person having ordinary skill in the art would have "obtained" the V_2 /BET ratio from the teachings of the prior art or from generally known considerations. In this regard, we note that Esch describes several parameters, including ratios of parameters,¹⁵ that are not recited in appealed claim 1. Thus, the field of parameters that might be selected for variation, especially in pairs, is not small. Nor has the Examiner shown that the artisan would have had any clue that improvements in silica as a filler for rubbers beyond those described by Esch would have been expected. On the present record, the only source of such insight is the 850 Specification. Hindsight is not a permissible basis on which to build a conclusion of obviousness.

We conclude, by the preponderance of the evidence of record, that the relative silanol group density correlates strongly with the ability of the claimed silicas to function as fillers for rubber mixtures. We conclude further that the weight of the evidence is that none of the prior art references

relative silanol group density to the allegedly "improved" precipitated silica described and claimed by Luginsland. There is, however, no credible evidence that this is the case.

¹⁵ See Esch, col. 2, ll. 28-42, describing physicochemical properties of the inventive precipitated silicas, including additional the additional parameters of pore volume PV, V_2/V_1 , and DBP/CTAB.

on which the Examiner relies, alone or in combination, teaches or suggests this correlation. Optimization of a parameter not recognized as being result-effective is not prima facie obvious. *Application of Antonie*, 559 F.2d 618, 620 (CCPA 1977).

Moreover, Luginsland co-inventor Wehmeier testifies that a comparison of rubbers compounded with silica of Example 3 of Esch with rubbers compounded with Silica III of the present invention shows that the silica of the invention provides superior processing properties and superior cured properties. (Exhibit A.) Similar results are also presented in the 850 Specification. (Spec., Table 4 at 39 and associated discussion.) The Examiner has not challenged the accuracy of Wehmeier's testimony or of the supporting disclosure. Nor, as indicated supra, has the Examiner explained why such results would have been expected. The Examiner's argument that the "single comparison" with Esch Example 3 is not commensurate in scope with the claimed subject matter (Ans. 20) is not well-taken. Luginsland has compared what is evidently the most useful precipitated silica taught by Esch (the only one, according to Luginsland, that has been commercialized), and shown an increase of about 25% in the V_2 /BET ratio. (Br. 5.) The effects on rubber processing properties and on the rubber product, according to the unchallenged testimony of Wehmeier, are significantly better than the best results of the prior art.

Luginsland has offered a plausible explanation of why the higher relative silanol group density leads to improved results: the large number of accessible silanol groups lead to more interactions with the rubber molecules. However "obvious" such an explanation may seem now, the

Examiner has not shown that there was any recognition in the prior art that such might be the case. Nor has the Examiner shown that there were any other reasons one might have varied parameters in the silica system and necessarily, if inadvertently, arrived within the recited range of the V_2 /BET ratio. Such circumstances are hallmarks of evidence of unpredictability in the art, and they undermine the Examiner's holding of prima facie obviousness.¹⁶

Moreover, even if one were, *arguendo*, to posit a holding of prima facie obviousness based on a reasonable expectation of successfully obtaining useful precipitated silicas throughout the ranges disclosed by the prior art, the same evidence of unpredictability would suffice to establish patentability based on unexpected results.

Accordingly, we REVERSE the rejections over the prior art of record.

The only remaining rejection of record is the provisional obviousness type rejection over Stenzel, a later-filed copending application. The policy of the USPTO in such circumstances is set out in the MPEP as follows:

If a “provisional” nonstatutory obviousness-type double patenting (ODP) rejection is the only rejection remaining in the earlier filed of the two pending applications, while the later-filed application is rejectable on other grounds, the examiner should withdraw that rejection and permit the

¹⁶ The Dissent (Dissent 1) cites additional case law, but applies a rule—or a presumption—of prima facie obviousness without explaining (or showing where the Examiner provided an explanation) why this is a “typical” case in which that rule applies. When rule is applied without justification, it has been applied improperly, in a *per se* manner.

earlier-filed application to issue as a patent without a terminal disclaimer.

MPEP § 804.I.B.1 (8th Ed., Rev. 5, 2006).

Accordingly, we need not reach the merits of the provisional obviousness type double patenting rejection.

C. Order

We REVERSE the rejection of claims 1-17, 18, 19, and 23-31 under 35 U.S.C. § 103(a) in view of the combined teachings of Esch and Boyer.

We REVERSE the rejection of claim 8 under 35 U.S.C. § 103(a) in view of the combined teachings of Esch and Boyer, and Uhrlandt.

We REVERSE the rejection of claims 1-7, 18, 19, and 23-29 under 35 U.S.C. § 103(a) in view of the combined teachings of Esch and Luginsland 693(app).

We REVERSE the rejection of claims 1-5, 7, 8, 18, 19, and 23-31 under 35 U.S.C. § 103(a) in view of the combined teachings of Uhrlandt and Boyer.

The attention of the Examiner is drawn to MPEP § 804.I.B.1 regarding the proper disposition of the provisional obviousness type double patenting rejection of claims 1-8, 18, 19, and 21-23 in view of claims 1-9, 16, 17, and 19-21 of Stenzel.

REVERSED

Owens, *Administrative Patent Judge*, dissenting.

Initially I note that the Sears values of the Appellants and Esch do not appear to be on the same basis.¹⁷ Esch's Sears value (V_2) is expressed in ml/g (col. 8, ll. 1-4) whereas the Appellants' Sears value is a modified Sears value (V_2) expressed in ml/(5 g) (Spec. 22:33, 24:7-10; claim 1). Thus, it appears that comparison of the Sears values of the Appellants and Esch requires that Esch's Sears values be multiplied by 5. The Appellants (Br. 5) and the Examiner (Ans. 5), apparently incorrectly, have considered the Sears values of the Appellants and Esch to be on the same basis.

Regardless of whether Esch's Sears values are multiplied by 5, Esch discloses (col. 2, ll. 17-18) a combination of Sears value (8-15) and BET surface area (100-150, within the Appellants' claim 1 range) which, when expressed as a Sears value/BET surface area ratio, overlaps the Appellants 0.150-0.370 claim 1 range. Esch's Sears value/BET surface area ratio range is 0.053 (8/150) to 0.150 (15/100) when the Sears value is not multiplied by 5, and is 0.267 (40/150) to 0.75 (75/100) when the Sears value is multiplied by 5. As stated by the Federal Circuit in *In re Peterson*, 315 F.3d 1325, 1329 (Fed. Cir. 2003), "[i]n cases involving overlapping ranges, we and our predecessor court have consistently held that even a slight overlap in range establishes a prima facie case of obviousness." The Court in *Peterson* cites *In re Woodruff*, 919 F.2d 1575, 1578 (Fed. Cir. 1990) wherein a claim's range ("more than 5% to about 25% carbon monoxide") was held to be prima facie obvious over a prior art range ("about 1-5% carbon

¹⁷ Like the majority (Decision 7) I do not discuss Uhrland because its disclosure is similar to that of Esch.

monoxide”) which merely abutted the claim’s range. *See Peterson*, 315 F.3d at 1329.

The majority argues that Esch would not have led one of ordinary skill in the art to select a Sears value/BET surface area ratio (Decision 7-8).

Esch’s failure to disclose a Sears value/BET surface area ratio does not take away from the prima facie obviousness of using silicas having Esch’s Sears values and BET surface areas within the disclosed ranges, including those which result in Sears value/BET surface area ratios falling within the Appellants’ claim 1 range.

The majority argues that Esch would not have led one of ordinary skill in the art to optimize the Sears value/BET surface area ratio because it is not recognized as a result effective variable (Decision 8). The majority argues that the Wehmeier Declaration shows that silicas having the Appellants’ Sears value/BET surface area ratio provide superior processing and cured rubber properties (Decision 8-9).

The Appellants can overcome the prima facie obviousness by providing evidence of unexpected results. *See Peterson*, 315 F.3d at 1330. For the following reasons the Wehmeier Declaration is not effective for doing so.

First, it is not clear whether the Declaration provides a side-by-side comparison of the claimed invention with the closest prior art. *See In re Baxter Travenol Labs.*, 952 F.2d 388, 392 (Fed. Cir. 1991); *In re De Blauwe*, 736 F.2d 699, 705 (Fed. Cir. 1984). Wehmeier compares the claimed silica to Esch’s Example 3, but does not indicate that the Sears value/BET surface

area ratio of Esch's silica is on the same ml/(5g) basis as the Appellants' silica.

Second, it is not enough for the Appellants to show that the results for the Appellants' silica and Esch's silica differ. The difference must be shown to be an unexpected difference. *See In re Freeman*, 474 F.2d 1318, 1324 (CCPA 1973); *In re Klosak*, 455 F.2d 1077, 1080 (CCPA 1972). Wehmeier states that the Appellants' silica provides improved performance compared to that of Esch's Example 3 (Declaration 7), but does not state that the improvement would have been unexpected by one of ordinary skill in the art.

Third, contrary to the majority's argument (Decision 9), evidence of unexpected results must be commensurate in scope with the claims. *See Peterson*, 315 F.3d at 1330; *In re Grasselli*, 713 F.2d 731, 743 (Fed. Cir. 1983); *In re Clemens*, 622 F.2d 1029, 1035 (CCPA 1980). The evidence in the Wehmeier Declaration does not meet that requirement. Wehmeier compares Esch's silica only to the Appellants' silica III (Decl. 1) which has a Sears value/BET surface area ratio of 0.216 ml/(5 m²) (Spec. 16:23). Wehmeier does not establish that the results obtained using that silica are representative of those obtained using silicas covering all of the Appellants' 0.150 to 0.370 ml/(5 m²) Sears value/BET surface area range that would have been prima facie obvious over Esch.¹⁸

¹⁸ The issue of whether the Sears values of the Appellants and Esch are on the same ml/(5 g) basis is relevant to the determination of the portion of the Appellants' Sears value/BET surface area range that would have been prima facie obvious over Esch.

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Because a prima facie case of obviousness has been established and has not been effectively rebutted by the Appellants, the rejections should be affirmed.

sld

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